REMARKS

1. Applicant thanks the Examiner for the Examiner's comments, which have greatly assisted Applicant in responding.

2. **Claim Rejections – 35 USC §101**

(a) Claims 1-35 were rejected because the claimed invention is directed to non-statutory subject matter.

Applicant has amended the independent Claims to clarify that the invention is directed to a system and method for use in the storage and retrieval of media in a database, which is statutory subject matter. Support can be found at least in the preambles of certain of the Claims and as follows:

> (On page 3, lines 15-18)
> It would be desirable to reliably translate image data into representations that would enable a computer to assess the relative proximity of meaning among images in a database.
>
> It would be desirable to have a computing system that can derive accurate, efficient, and manageable representations of images for later recall, retrieval, and association.

> (On page 3, lines 20-21)
> The present invention is directed to a system and method for generating context vectors for use in a document storage and retrieval system.

> (On page 30, line 19 through page 31, line 7, emphasis added)
> We assume the existence of a **large data set (text, imagery, sound, video, etc.)**. By large it is meant that if the statistics of the structures we will study are determined using a (randomly chosen) sizable subset of the **database** that these

statistics will not, with very high probability, change significantly if re-measured on the whole data set.

We assume that our data set is densely endowed with what we will call elements, each of which belongs to one of N classes. For example, in text, the elements are words that belong to a designated lexicon (other words are ignored). **Each lexicon word in the database** belongs to one of N classes (stems). In imagery, the elements might be the objects designated by an automated attentional focusing system. These elements would each be assigned to a single class (where the classes are self-defined as distinct "clusters" of range/azimuth/elevation/background--insensitive feature vectors).

For convenience, we will assume that **each element A in the database** is numbered with a unique integer index i. We will refer to the i^{th} element of the database as A_i. The number of the class to which A_i belongs will be denoted by c_i, where $1 \leq c_i \leq N$. The set of indices of all elements belonging to class K, $1 \leq K \leq N$, will be denoted by S_K.

Each time an element appears **in the database** other elements typically appear "near" it.

Also, according to MPEP 2106,II,(A):

> **A. Identify and Understand Any Practical Application Asserted for the Invention**
>
> The claimed invention as a whole must accomplish a practical application: That is, it must produce a "useful, concrete and tangible result." *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601-02.

Clearly, the invention as a whole provides for a computer system and method that can derive accurate, efficient, and manageable representations of images and documents for later recall, retrieval, and association in a database. Applicant asserts that

approaches for storing and retrieving documents and images in and from a database are tangible results and are not abstract results.

As such, Applicant is of the opinion that the rejection is overcome and respectfully requests that the Examiner withdraw the rejection under 35 USC §101.

(b) Claims 1-17 and Claims 27-33 were rejected because the claimed invention lacks patentable utility. Specifically, the Examiner concluded that since Claim 1 @ step 2 eliminated information content with substantially orthogonal vectors, step three will always result in no proximal co-occurrences or he independent and related dependent claims will never convey any utility and asserted that Claims 27-33 are similarly rejected.

Applicant respectfully traverses.

The patent application as a whole clearly teaches training which includes initializing a given set of context vectors and then adjusting such initialized context vectors based on determined proximal co-occurrences of the information items. Support can be found at least in the discussion of Figure 3 and the corresponding text in the Specification as follows:

> (On page 5, line 3 through 24, emphasis added)
> Context vectors are developed for individual words or terms based on proximity to other words. **This learning technique is performed on a training set of documents.** Referring now to FIG. 1B, there is shown a block diagram of the training system. A training text 101, stop list 103, and phrase list 104 are provided to a preprocessor 102. Training text 101 includes a set of documents for training. Stop list 103 includes a list of words that are deemed uninteresting and are not to be considered in training (e.g., prepositions and common words). Phrase list 104 includes a list of multiple-word phrases that are to be treated as a

single word for training purposes (e.g., "world series", "golden parachute", "best man").

Referring now also to FIG. 3, there is shown a flowchart of the training process. The system starts by preprocessing the documents in the training set. Preprocessing consist of several steps, including: 1) removing stop-listed words from the set of training words; 2) consulting phrase list 104 to locate and mark multiple-word phrases that are to be treated as a single word; and 3) reducing words to "stems" in order to increase the effectiveness of the training process—thus, "investments", "investor", and "investing" share the stem "invest" and may be treated alike.

The set of word stems generated by preprocessor 102 is fed to learning system 105 which generates a set of stem context vectors 106 according to the method shown in FIG. 3. Each context vector consists of a fixed number of components (200 or more in the preferred embodiment).

Learning system 105 generates stem context vectors as follows. **First, initial conditions are assigned 303.** In the preferred embodiment, initial conditions are assigned by generating a random context vector for each stem, consisting of components selected by zero-mean, unit-variance Gaussian random number generation. Since the system uses dot products as the measure of relationship strength, **mutual orthogonality is a desirable initial condition.** This is due to the fact that near-orthogonal vectors will have dot products close to zero. This near-zero dot product corresponds to a weak initial relationship. Assigning a random context vector provides an initial condition that approximates mutual orthogonality. As will be recognized by those skilled in the art, other techniques of assigning initial conditions can be employed.

The system then starts with the first document 304 and proceeds through every document in the training corpus. For each document, it starts at the first word stem 305 and passes through the document, targeting each word stem, one by one. As each stem is targeted, the system applies 306 a learning law to the target.

The method of Claim 1 clearly initializing the context vectors and then determining proximal co-occurrences of the information items. Nowhere does Claim 1 recite *how* determining proximal co-occurrences of the information items is accomplished. The excerpt hereinabove puts forth an example of an embodiment of Claim 1.

Further, according to MPEP 2173.04 Breadth Is Not Indefiniteness (emphasis added):

> Breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with **35 U.S.C. 112**, second paragraph.
>
> Undue breadth of the claim may be addressed under different statutory provisions, depending on the reasons for concluding that the claim is too broad. If the claim is too broad because it does not set forth that which applicants regard as their invention as evidenced by statements outside of the application as filed, a rejection under **35 U.S.C. 112**, second paragraph, would be appropriate. **If the claim is too broad because it is not supported by the original description or by an enabling disclosure, a rejection under** 35 U.S.C. 112, **first paragraph, would be appropriate.** If the claim is too broad because it reads on the prior art, a rejection under either **35 U.S.C. 102** or **103** would be appropriate.

Applicant has shown that the Specification supports Claim 1. Therefore, the rejection is improper.

As such, Applicant is of the opinion that the rejection is overcome and respectfully requests that the Examiner withdraw the rejection of Claim 1-17 under 35 USC §101. Similarly, Applicant is of the opinion that the rejection of Claims 27-33 is overcome and respectfully requests that the Examiner withdraw the rejection under 35 USC §101.

3. **Claim Rejections – 35 USC 112, first paragraph**

Applicant respectfully traverses.

According to current case law, Applicant is of the opinion that the rejection of Claims 1-17 and Claims 27-33 are moot in view of the above. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC §112, first paragraph.

4. **Claim Rejections – 35 USC 112, second paragraph**

Applicant respectfully traverses.

(a) Claim 1, 27, and 33

In view of the discussion hereinabove for Claim 1 (and similarly Claims 27 and 33), Applicant is of the opinion that the rejection is improper. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC §112, second paragraph.

(b) Claim 18

Applicant has deleted references to D as one skilled in the art is familiar with the Singular Value Decomposition of matrices. Applicant is of the opinion that the rejection is overcome and respectfully requests that the Examiner withdraw the rejection under 35 USC §112, second paragraph.

(c) Claim 21

Applicant respectfully points out that this rejection was withdraw by the Examiner's own admission in item 11 of the current office action.

(d) Claims 23-26, 29

Applicant understands this rejection to be similar to that for Claim 1 hereinabove. As such, Applicant is of the opinion that in view of the discussion for Claim 1 and the amendment to the corresponding independent claims, such rejection is now moot. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC §112, second paragraph.

(e) Claims 34, 35

Applicant points out to the Examiner another embodiment on page 23, lines 6 through page 24, line 2 and the Summary Vector Indexing section beginning on page 81. Applicant is of the opinion that the Specification supports the Claims and as such, the rejection is improper. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC §112, second paragraph.

5. It should be appreciated that Applicant has elected to amend the Claims solely for the purpose of expediting the patent application process in a manner consistent with the PTO's Patent Business Goals, 65 Fed. Reg. 54603 (9/8/00). In making such amendment, Applicant has not and does not in any way narrow the scope of protection to which Applicant considers the invention herein to be entitled. Rather, Applicant reserves Applicant's right to pursue such protection at a later point in time and merely seeks to pursue protection for the subject matter presented in this submission.

CONCLUSION

Based on the foregoing, Applicant considers the present invention to be distinguished from the art of record. Accordingly, Applicant earnestly solicits the Examiner's withdrawal of the rejections raised in the above referenced Office Action, such that a Notice of Allowance is forwarded to Applicant, and the present application is therefore allowed to issue as a United States patent. The Examiner is invited to call to discuss the response.

Respectfully submitted,

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